Docket No.: **582/9-1477**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant:	Albert BAUER	Conf. no. 2665
Serial No.:	08/998,507	Group Art Unit: 3743
Filed:	December 26, 1997	Examiner: John Ford
For:	AIR CONDITIONING APPARATUS	

Commissioner for Patents
Washington, DC 20231

REPLY BRIEF

Sir:

This is a Reply Brief responsive to the Supplemental Examiners' Answer mailed on January 9, 2007. Pursuant to 37 CFR 41.50(a)(2)(ii), the appellant hereby maintains the present appeal in the above-referenced matter.

While the examiner failed to identify the Miscellaneous Statement submitted on January 9, 2007 as a Supplemental Examiner's Answer, as a written response to the Boards' remand, under 37 CFR 41.50(a)(2), it must be taken as such.

I. THE REMAND

The Board remanded to the examiner with two options, the Examiner choosing the second option, to identify structure from appellant's disclosure for performing the function of the "means for regulating. ." recitation, and where it is found in the specification. Additionally, the Board required the examiner to re-explain Johannsen, referencing structure alleged to correspond to the structure the examiner identifies from appellant's disclosure.

In the remand, the Board stated: "Appellant has not pointed to any disclosure that room temperature is varied in correspondence to the selected room temperature, much

less any disclosure of specific structures for actually performing such function…." (P.6, 1.3-5), apparently based on an earlier statement that:

"We understand appellants response to be an argument that the 'means for regulating….' recitation is to be interpreted as requiring structure that regulates a pressure increase in the room relative to an outside pressure so as to vary <u>the room temperature</u> in correspondence (i.e., as a function of) the selected room temperature."

This is inconsistent with the language of claim 44, and the discussion presented in the main Appeal Brief and the Supplemental Appeal Brief submitted on 25 July 2006.

The Examiner noted this error on page 6 in his statement, and presumed this to be an inadvertent error. The error appearing twice leads to a concern that the claim may be misinterpreted. For clarity, the limitation of claim 44 in issue is repeated here:

> <u>means for regulating an increase in pressure in the at least one room</u> relative to an outside pressure, <u>to vary the room pressure in correspondence to the selected room temperature</u>. (Emphasis added)

<u>II. THE ISSUES</u>

The first issue is whether there is structure disclosed in the specification which supports the "means for regulating…" limitation, that is, structure which enables regulating an increase in room pressure, relative to an outside pressure, to vary the <u>room pressure</u> in correspondence to the selected room temperature, or more simply, structure capable of regulating a controlled increase in room pressure in response to a selected room temperature.

The second issue is whether the claimed "means for regulating…" are found in the prior art (anticipation) or taught or suggested in the prior art (obviousness). While both issues are addressed below, a discussion of the inventive system is first necessary.

<u>III. THE INTEREPRETATION OF THE SPECIFICATION</u>

The Board took the sentence bridging pages 21-22 that referenced "sub pressure P_{AB} is generated for the <u>maintaining</u> of a <u>predetermined excess pressure</u> in the rooms…." (emphasis added) as meaning that the claimed system maintains a <u>constant</u> excess

pressure. The Board also raised the issue of whether the change in supply air pressure equated to a change in room air pressure.

First, that the excess pressure is "predetermined" does not necessarily mean that the excess pressure <u>remains constant</u>. This statement, when interpreted relative to the entire disclosure in the specification, clearly only refers to the desire to maintain at least a minimum excess pressure, that is, a lower threshold of excess room pressure, as further clarified by reference to the specification:

> "If in a large room, several windows are open, the exhaust fan can be shut off entirely – only in this way is it possible to maintain a slight excess pressure." P.24, l.21-22.
>
> "Underlying the invention is the perception that the greater the excess pressure is in a room to be air-conditioned, the better is the ventilation by the supply air blown through the room. Therefore, the room warms up faster, the efficiency of the installation is improved and great temperature fluctuations in the room are avoidable for example, very warm at the top and very cool at the bottom, as are also temperature differences over the length and width of the room." P. 2, l. 8-12
>
> "Here above all, the room excess pressure varies exclusively over a predetermined temperature … of the supply air temperature, with a change in the … supply air temperature, in which with an outside [or room] temperature below this temperature range, the room excess pressure has … a certain constant value, and, with …[a] supply air temperature above this temperature range, the room excess pressure always has a further definite constant value. Above all, with rising outside [or room] temperature, … the room pressure falls from a maximum excess pressure to a minimal excess pressure. P. 4, l. 10-18
>
> "The temperature of the supply air and the channel pressure of the supply air are coupled with one another in such a manner that both, in dependence on the value of the room temperature to the value of the supply air temperature and also in dependence on the value of the room temperature to the desired value of the room temperature<u>, the channel pressure of the supply air is raised or lowered **in the room, rooms, or room zones**</u>."(P.5. L.5-10, emphasis added)
>
> "With air-conditioning for several rooms, the heated supply air is made available over a common supply air channel. In case of different desired and actual temperatures of all the rooms, however, each room has a

> different heating requirement. In order to take this circumstance into account, ….the individual rooms or room zones are connected in each case through a supply air and an exhaust air line allocated to them from the central supply air and exhaust air channels, and in the individual supply air and/or exhaust air lines, throttle control valves are arranged through which <u>the channel pressure of the supply air is adjusted **in the rooms or room zones.**</u> P. 8, l. 5-14

This disclosure confirms that the room excess pressure does vary relative to the temperature, and supports appellants' contention that changes in the supply air pressure raise or lower the room pressure.

<u>IV. THE TIRE ANALOGY</u>

The examiner found appellants' tire analogy to be particularly relevant, and relied on it in his reply to the Board. For illustrative purposes, the tire analogy will be repeated to clarify the meaning of the disputed claim language.

A tire typically is like a closed room, containing a certain volume of air at a certain minimum pressure, i.e. 35 psi. When the pressure drops, air is occasionally added to return the pressure to 35 psi.

In some filling systems, a user sets a pressure, connects a hose to the tire, the air filling the tire until the pressures are equal, and there in no flow into the tire; in others, a high pressure source is connected to the tire intermittently, in an on/off sequence, until the pressure is reached, confirmed by a tire gauge.

While normally a closed system, hypothetically, the tire could be directly connected to the set air supply by a hose, or to the high pressure supply through an on/off valve. If the set air supply was maintained at the set pressure of 35 psi, the tire would have the same pressure as the air supply, which of course, is the same pressure as the supply hose. With the on/off system, the valve would cycle, so the pressure could be maintained. In either case, any loss would immediately be made up.

If the tire develops a small puncture, air will leave the tire, causing more air to flow into the tire, to make up for the loss. If the amount flowing in is the same as the

amount flowing out, the pressure will be maintained. In essence, the tire now has a minimum flow-through ventilation system, with the tire pressure maintained at 35 psi.

Of course, there has to be a pressure difference between the inside and outside of the tire; if the outside atmosphere was at 40 psi, no flow would occur; air would leak into, not out of the tire, so <u>a minimum excess pressure relative to the outside pressure must be maintained to assure ventilation</u>.

In a simple embodiment of the invention, a room is connected by a supply duct to a supply air source which, to assure a minimum level of ventilation, supplies enough air to maintain a minimum excess pressure, above ambient, as air flows into and out of the room. The room is connected to an exhaust duct, the equivalent of the small puncture. The exhaust rate can be set by the size of an opening, relative to the amount of air that the supply air blower can displace so as to always maintain a minimum room excess pressure, otherwise, air would not flow out of the room.

There is no requirement that there be an exhaust air blower to assure minimum ventilation: as discussed above, an open window can substitute for an exhaust air blower. In buildings with multiple rooms or room zones, having individual inlet and outlet dampers on each room, similar to the on/off system, would enable control of the room pressure and flow by the operation of these valves, as also referenced above.

V. JOHANNSEN

When an exhaust fan is used to draw air out of the room, as discussed in Johannsen, the exhaust blower is set to draw out somewhat less air than the amount blown in so as to maintain a constant excess pressure.

"Fig. 5 illustrates the required relationship between air flow of the discharge blower and the return blower in a typical distribution system... curve 160 represents the required relationship between the two blowers for the hypothetical building under discussion. Broken line 161...represents equal values of the supply and return blowers. Curve 160 is offset below curve 161 by a constant value of 5000 CFM, so that at a supply blower rate of 40,000 CFM, the return blower requirement is 35,000 CFM and so on down to a 0 return blower requirement for a 5000 CFM supply air flow. The 5000 CFM difference represents the relatively constant exhaust from the building through bathroom vents and the like previously discussed. In actual practice the actual blower is operated at slightly less than the values indicated in Fig. 5 so that a slight positive pressure will be maintained in the building...." Col. 12, lines 38-60. (Emphasis added)

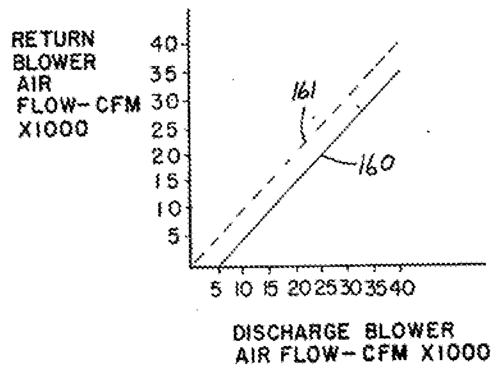


FIG. 5

Taking the Johannsen example, when a supply blower supplies 10,000 CFM to a room, the exhaust blower should operate to remove about 5000 CFM to maintain a minimum excess pressure in the room. Any increase in flow from the supply blower causes a corresponding increase in flow from the exhaust blower, as illustrated in Fig. 5, so the same minimum excess pressure is maintained, regardless of quantity of air moved.

In Johannsen, the supply blower has a range of 5-40,000 CFM, the exhaust blower having a corresponding range, of 0-35,000 CFM, as the two operate in tandem. Even if there is a call to increase or decrease the amount of air delivered to the room, to heat or cool the room, the room pressure will not change, as there will be a corresponding increase or decrease in the amount of air removed from the room.

Going back to the tire, if the leak could get larger or smaller, the amount of air supplied may vary, but the pressure would not be varied; the pressure of 35 psi would be maintained.

<u>VI. INCIDENTAL PRESSURE VARIATIONS ARE NOT "REGULATED"</u>

Would there be incremental pressure variations? The Examiner seems to think this question is critical. In his analysis he states:

> It is absolutely clear that the room pressure must <u>vary</u> as a function of the selected room temperature (set on the thermostat) in each room in Johanssen. When the damper unit opens, responsive to a call for conditioned air from its associated thermostat, the room pressure rises just as described by Appellant in his Petition under 37 C.F.R. 1.181(a)(1){Paper No. 38, received December 15, 2003). Beginning four lines from the bottom of page 2 through page 4, line 8 of Paper No. 38, Appellant explains, using an analogy, that a pressure of the room tends to follow the regulated pressure in the supply duct feeding the room as the air in a vehicle tire being filled from a regulated source at the filling station ultimately reaches the regulated pressure of the source. Basically, each room in Johanssen, to use Appellant's analogy, is like a tire and when the thermostatically controlled damper unit opens, the air from the pressure regulated supply duct (which supply duct pressure must be at a higher pressure than the room pressure, otherwise the supply air would not enter the room, just as the air pressure at the filling station is set to a regulated pressure higher than the pressure prevailing in the tire by the time the driver notices it is "low") flows into the room and builds up the pressure.

While slight fluctuations would occur, the examiner failed to consider that Johannson specifically describes what happens when the dampers open and close, and provides means for preventing variations in room pressure when the dampers open or close:

> "Assume that during the time interval from t.sub.0 to t.sub.1 that the pressure sensed at lead 43 starts to decrease. This could be caused, for example, <u>by the opening of one or more vent outlets in the</u>

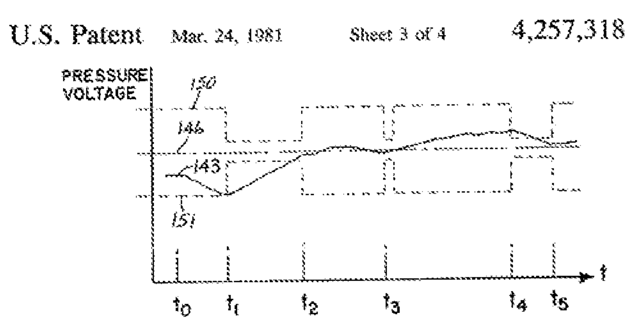


FIG. 4

distribution system. This decrease in pressure is reflected in the downward slope of curve 143 in FIG. 4. At time t.sub.1 curve 143 intersects the dead band threshold of broken line 151. …When amplifier 96 changes states, lead 107 goes high turning on transistor 116 and energizing relay 117. With reference to FIGS. 1 and 2, this causes the supply vane actuator 31 to operate in a direction to open supply blower vanes 33 to increase the volume output of the blower. At the same time, the high level at lead 107 couples through diode 108 to cause comparator 102 to change states and turn on switch 101. …

However, when either amplifier 96 or amplifier 95 switches to its high state, the output is coupled through diode 108 or 106 to amplifier 102, causing it to switch on. This brings resistor 100 in series with resistor 85 and reduces the voltage difference existing between leads 90 and 91. This is reflected in FIG. 4 by the narrowing or the closing together of broken lines 150 and 151 following time t.sub.1. This has the effect of narrowing the dead band. As the vane actuator motor is being driven to a more open position, the pressure in the system starts to increase, reflected by the upward slope of curve 143. Even though the pressure rises above the position of dotted line 151 prior to time t.sub.1 amplifier 96 stays on and relay 117 continues to command an increase from the discharge, because of the narrowed threshold. Due to the hysteresis added by resistor 98, the actuator relay 117 will stay on until the pressure signal 143 increases above the narrow position of threshold 151, to a point very near the set point 146. This occurs at time t.sub.2. …

The sequence of events between time t.sub.0 and t.sub.2 would be similar if the pressure had gone to high instead of too low. In that case, amplifier 95 would have been turned on to energize actuating relay 114 to cause the vanes of the supply blower to move toward the close position. At the same time the narrow threshold would have been established by diode 106 and comparator 102 in the manner previously described….

It will be apparent from the foregoing description that the system provides a variable dead band control that achieves both long-term and short-term accuracy and stability. By use of the wide dead band, constant chattering or hunting of the system is minimized. By switching to the narrow dead band setting when a repositioning of the blower supply vanes is required, the system ensures that the monitored pressure will be returned, not just barely inside the dead band threshold boundary, but inside the narrowed threshold boundary to very near the commanded pressure value.

The variations that are damped, so the pressure tracks very cloely with the commanded pressure, using the dead band controller of Johansen, occur over the full range of ventilation, from 5000 CFM to 40,000 CFM.

The examiners' analysis is further flawed since the invention relates to "regulating" an increase in room pressure, to vary the room pressure, in correspondence to the selected room temperature. Johannsen does the opposite, regulating the room pressure to avoid varying the room pressure, regardless of any changes in room temperature, i.e., opening or closing of the dampers. Dampers may open or close but room pressure is not varied in correspondence thereto.

VII. WHAT DOES "IN CORRESPONDENCE" MEAN?

As stated on page 6, lines 13-18 "in the first place, for the heating case in which the desired value of the room temperature is less than the actual value of the room temperature, the channel pressure of the supply air is lowered with rising room temperature. Correspondingly, for the cooling case, in which the desired value of the room temperature is greater than the actual value of the room temperature, the channel pressure of the supply air is lowered with falling room temperature."

The effects on room pressure are illustrated in Fig. 6a, where the actual room temperature is less than the desired room temperature, and Fig. 6b, showing an exemplary pressure profile when the actual room temperature is greater than the desired room temperature. (Spec. p. 14, l. 20-26)

Going back to the tire analogy, we need another variable – friction. Presume that for uphill travel, more traction would be beneficial, and reducing the tire pressure to 30 psi would increase friction. Similarly, presume that when traveling downhill, we would like to reduce friction to minimize rolling resistance, and would like to increase the tire pressure to 40 psi.

Now add an inclinometer which operates like a thermostat: when an uphill is sensed, i.e. , the actual incline value is positive relative to the set value, a signal is sent to the pressure controller, to reset the set point for the supply air to 30; when a downhill is sensed, the actual incline value is negative relative to the set value, a signal is sent to the

pressure controller to reset the set point for the supply air to 40. The normal setting set is sent when there is no difference between the set point and the actual incline at 35 (this corresponds to a minimum excess pressure, though in this example, it is mid-range).

This system has means to regulate an increase in the tire pressure, relative to an outside pressure, (all settings, whether 30, 35 or 40, are an increased pressure relative to the ambient pressure) to vary the tire pressure in correspondence to the incline of the vehicle, that is, the tire pressure at any particular time is a function of the incline of the vehicle.

Looking at Mr. Bauer's invention, there is a coupling of the supply pressure with the selected room temperature, in just the same way. In Fig. 6a, when the actual room temperature is less than the desired room temperature, the thermostat calls for a temperature correction, which at the same time initiates a change in the supply pressure, and necessarily the room pressure, to vary from the minimum to the maximum. Fig. 6b shows the pressure being varied from the maximum to the minimum, when the actual room temperature is higher than the thermostat setting (desired room temperature).

FIG.6a

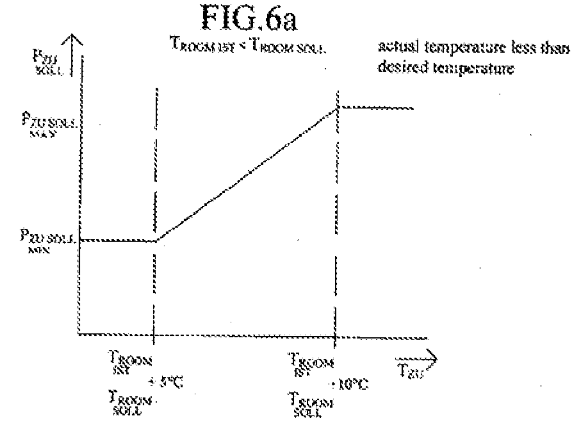
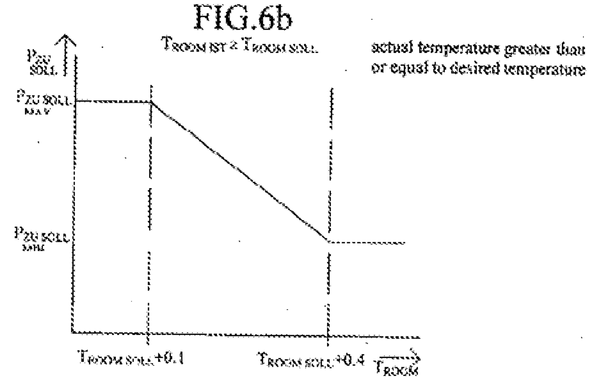


FIG.6b



VIII. THE STRUCTURE

The structure that allows this variation in room pressure as a function of room temperature can be found with reference to the element 200, shown in figures 2 and 10.

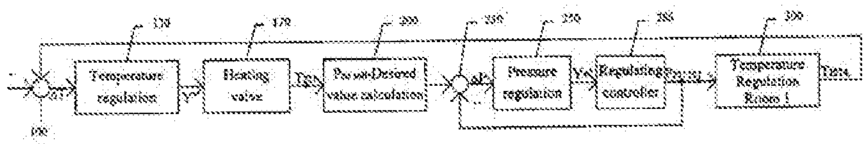


FIG.2

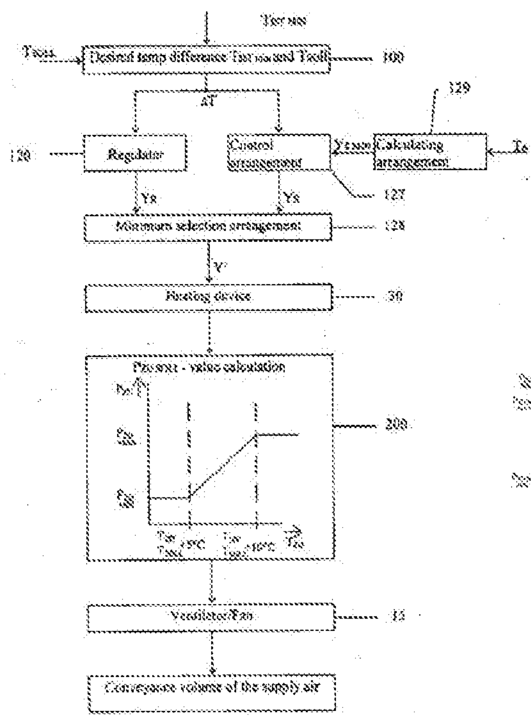
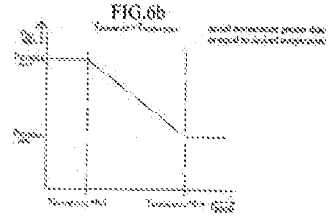


FIG.6b



The relevant portion of figure 2 is shown above. The actual room temperature is fed to the element 100 which compares this to the desired temperature setting. If the room temperature is 60°F, and the thermostat is set at 68°F, this creates a signal that more hot air is needed ("uphill" setting). This is relayed to a heater which acts to increase the supply air temperature, but here as well, the call for a supply air temperature increase is

also fed to the pressure value calculating controller 200. The controller 200 then signals a new set point for the supply air pressure, shown in Fig. 10 as Pzumax, which is compared to supply air pressure, Pzuist, with the regulator then increasing the supply blower output to vary the supply pressure, and correspondingly the room pressure, raising Pzuist to Pzumax.

When the actual room temperature rises above the desired temperature, this difference begins another control adjustment, ("downhill" setting) and the controller 200 responds according to the pressure profile of Fig. 6b, that is, the controller sends a new set point to the pressure regulator, Pzumin, and the supply blower output is reduced to reduce the pressure in the supply duct, and the room, so that Pzuist is reduced to Pzumin.

These pressure variations are deliberate and controlled; i.e. "regulated"; they are not incidental to operation of a ventilation system, and the control circuit clearly "varies the increase in room pressure in correspondence to selected room temperature": changes in the difference between the desired room temperature and the actual room temperature will result in the room pressure varying between Pzumax and Pzumin; the room pressure at any time is a function of the temperature of the room.

Control elements are structural; the controller 200, having a temperature signal input and generating a pressure signal output, provides the capability for increasing the room pressure is correspondence to the selected room temperature. The references cited by the examiner do not show, teach or suggest an element which performs the function of the controller 200.

IX. JOHANNSEN IS MISSING THE MEANS FOR REGULATING

Johannsen is best characterized as "What goes in must comes out", which maintains a constant pressure across the full range of volume requirements. The room pressure does not increase; opening or closing a damper only causes the system to make corrections so as to maintain the constant pressure. There is no controller 200 that can receive signals from a temperature regulating circuit, and change a pressure setting to follow the profiles, for example of Figs 6a and 6b.

To the extent that the supply blower increases speed, the exhaust blower tracks it fairly closely, so that the level of excess room pressure is constant.

There is no coupling of the temperature control with the pressure control system as discussed above. Going back to the tire example, going uphill or downhill will not effect any changes in tire pressure without the inclinometer signal; gravity, friction, and ambient temperatures may incidentally alter the tire pressure, but the system would respond to keep a steady 35 psi.

X. THE CLAIMS ARE NOT ANTICIPATED

Claims 44 and 51-59 were rejected as being anticipated by Johannsen.

A finding of anticipation requires that the publication describe all of the elements of the claims, arranged as in the patented device. Shearing v. Iolab Corp., 975 F.2d 1541, 1544-45, 24 U.S.P.Q.2D (BNA) 1133, 1136 (Fed. Cir. 1992). Anticipation requires strict identity, without guessing what the reference discloses. Dayco Products, Inc. V. Total Containment Inc., 329 F.3d 1358 (Fed. Cir. 2003).

As Johannsen does not contain an element corresponding to controller 200, claims 44 and 51-59 are not anticipated thereby.

XI. THE CLAIMS ARE NOT OBVIOUS

Claims 44 and 51-59 were rejected under 35 U.S.C. §103(a) as being unpatentable over the Johanssen as applied to claims 44 and 51-59 and further in view of Rayburn, et al U.S. Patent No. 5,971,067.

In order to uphold a finding of obviousness, there must be some teaching, suggestion or incentive for doing what the applicant has done. ACS Hospital Systems, Inc. v. Montefiori Hospital, 723 F.2d 1572 (Fed. Cir.1984). It is not within the framework of 35 U.S.C. §103(a) to pick and choose from the prior art only so much as will support a holding of obviousness to the exclusion of other parts necessary for a full appreciation of what the prior art teaches or suggests, as hindsight is not the test. In re Wesslau, 353 F.2d 238 (C.C.P.A. 1965). Also, "both the suggestion and the expectation

of success must be found in the prior art, not in the applicant's disclosure". In re Dow Chemical Co., 837 F.2d 469 (Fed. Cir. 1988).

As described above, Johannsen teaches away from the present invention. The dead band controller is designed to minimize excursions from a command set point pressure and there is nothing to teach or suggest incorporating a regulation of an increase in room pressure to vary the room pressure in correspondence to a selected room temperature. Again, there is a no integration of pressure control with the room temperature control, and any pressure altering condition is immediately eliminated.

Rayburn Fig. 2 and Col. 7, lines 1-12 was cited as describing how conventional zone air controllers operate. However, there is no disclosure in Rayburn of providing means for regulating an increase in room pressure in correspondence to a selected room temperature, nor is there any teaching suggestion or incentive found in either patent to provide the system of the present invention. Rayburn is directed to monitoring air quality, and providing fresh air when a monitored air quality falls below a threshold level. Even assuming the combination were proper, there is nothing in the combination which would lead one skilled in the art to the invention of claim 44.

Following the teachings in the references, rather than speculation, would lead one to possibly use the dead band controller of Johannsen, which closely maintain room pressure, regardless of the variations in air flow volume, in a system which monitors air quality, for example, to dampen pressure fluctuations when more or less fresh air is required. Thus, one is lead away from, not towards, the applicant's inventions.

The combination of references does not teach, suggest or even hint at the applicant's invention, and claim 44 is not rendered obvious by this combination.

XII. SUMMARY

The examiner believed appellants' presentation of the system operation to be inconsistent and confusing. To the extent that was correct, the undersigned hopes that the operation of the claimed system is now clear. The Examiner did have the opportunity to review his concerns directly with the inventor, in an interview conducted on September 30 2002; the Examiner may have forgotten as this occurred long ago. Mr. Bauer traveled

from Germany to discuss his invention with the Examiner, accompanied by Mr. Blach, the facilities manager for the Johannes Kepler University in Linz, Austria, a location that successfully utilized the Bauer system. The Examiner was presented with a video showing smoke tests conducted at the University, and in the Munich Philharmonic House, another location where the system was installed.

Integration of Mr. Bauer's system reduced hot and cold spots, balancing room temperature and air flow to provide a uniform, comfortable environment. His system also allowed tuning to increase the quantity of fresh air delivered to avoid the air quality problem discussed in Rayburn, while at the same time generating energy savings, as the amount of recycled air was substantially reduced. Mr. Blach confirmed these results. This demonstrated the importance of varying the room pressure relative to the room temperature.

No request for oral hearing was previously submitted. However, under 37 CFR 41.47(b), a request can be made within two months of the filing of a supplemental Examiners' Answer. Given the effort spent to date on this matter by the Board, a request for Oral Hearing is being submitted for the sole purpose of clarifying any remaining questions the Board may have, the appellant recognizing that the Board may in its' discretion decide that a hearing is not necessary.

XIII. CONCLUSION

Based on the above remarks, claims 44-46 and 51-59 are believed to be novel and unobvious and reversal of each rejection is respectfully requested.

Respectfully submitted,

____/WJS/_______________

William J. Sapone
Registration No. 32,518
Attorney for Applicant(s)

COLEMAN SUDOL SAPONE, P.C.
714 Colorado Avenue
Bridgeport, Connecticut 06605-1601
Telephone No. (203) 366-3560
Facsimile No. (203) 335-6779